

# Accepted Manuscript

Title: Performance characterization of a bubble pump for vapor absorption refrigeration systems

Author: J. Aman, P. Henshaw, D. S-K. Ting

PII: S0140-7007(17)30358-4

DOI: <https://doi.org/doi:10.1016/j.ijrefrig.2017.09.011>

Reference: IJIR 3751

To appear in: *International Journal of Refrigeration*

Received date: 27-5-2017

Revised date: 8-9-2017

Accepted date: 17-9-2017

Please cite this article as: J. Aman, P. Henshaw, D. S-K. Ting, Performance characterization of a bubble pump for vapor absorption refrigeration systems, *International Journal of Refrigeration* (2017), <https://doi.org/doi:10.1016/j.ijrefrig.2017.09.011>.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

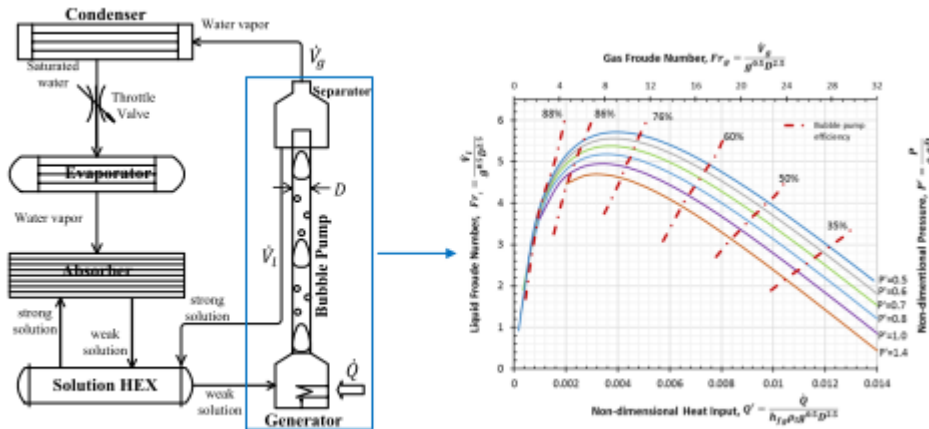


# Performance Characterization of a Bubble Pump for Vapor Absorption Refrigeration Systems

J. Aman<sup>1</sup>, P. Henshaw, D. S-K. Ting,

*Turbulence and Energy Laboratory, Centre for Engineering Innovation, University of Windsor, 401 Sunset Avenue, Windsor, Ontario N9B 3P4, Canada*

## Graphical Abstract



## Highlights:

- A heat-driven bubble pump can eliminate the electrical pump in a VAR system.
- A dimensional analysis was performed to characterize bubble pump performance.
- Experimental and theoretical results for a new refrigerant-absorbent solution (LiCl-H<sub>2</sub>O) were compared.
- The flow regime was determined for the highest pump efficiency.

## Abstract:

A thermally driven bubble pump has been used for an ammonia (refrigerant)-water (absorbent) vapor absorption refrigeration (VAR) system, which is known as a diffusion absorption refrigeration (DAR) system since the 1920s. However, the use of a bubble pump in a water based refrigerant VAR system has not been reported. In a bubble pump-operated VAR system, the cycle performance as well as the bubble pump performance completely depend on the refrigerant-absorbent solution properties and the bubble pump parameters. Although a few analytical models have been developed for the performance analysis of a bubble pump operated refrigeration cycle, the analytical model of the bubble pump itself has not been reported. In this study, a dimensional analysis was performed, considering bubble pump geometry and the

<sup>1</sup> Corresponding author: [amanj@uwindsor.ca](mailto:amanj@uwindsor.ca) (J. Aman)  
[henshaw@uwindsor.ca](mailto:henshaw@uwindsor.ca) (P. Henshaw), [dting@uwindsor.ca](mailto:dting@uwindsor.ca) (D. S-K. Ting)

Download English Version:

<https://daneshyari.com/en/article/7175423>

Download Persian Version:

<https://daneshyari.com/article/7175423>

[Daneshyari.com](https://daneshyari.com)